Distributed Resource Plan

Data and Data Sharing

April 2015

Silver Spring® NETWORKS

Silver Spring Networks is the industry's leading provider of networking platforms for mission critical infrastructure

We have been making the internet-of-things a reality for mission critical infrastructure

The Leader In Critical Infrastructure Networks

- A decade of innovation and global success
- Volume leader with more than 23M homes and businesses networked
- Proven multi-application network for energy and smart city applications
- Broadest ecosystem with 125+ partners
- 189 Patents granted, 169 pending

- Smart grid product of the year - **Gen4**
- Smart grid product of the year - **SilverLink**
- American Tech award – **Street lights**

Global Customer Success

100% Focus on Creating Value for Our Clients

Silver Spring NETWORKS

Largest Ecosystem of 125+ Partners

Silver Spring NETWORKS

One Network, No Compromises

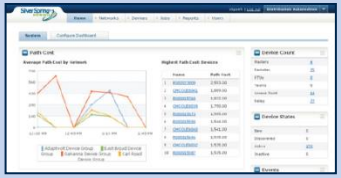
Utility Back-office Systems

Third Party Data & Applications

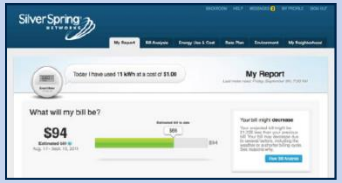
Silver Spring Message Bus

Silver Spring Applications

UtilityIQ
Unified Software

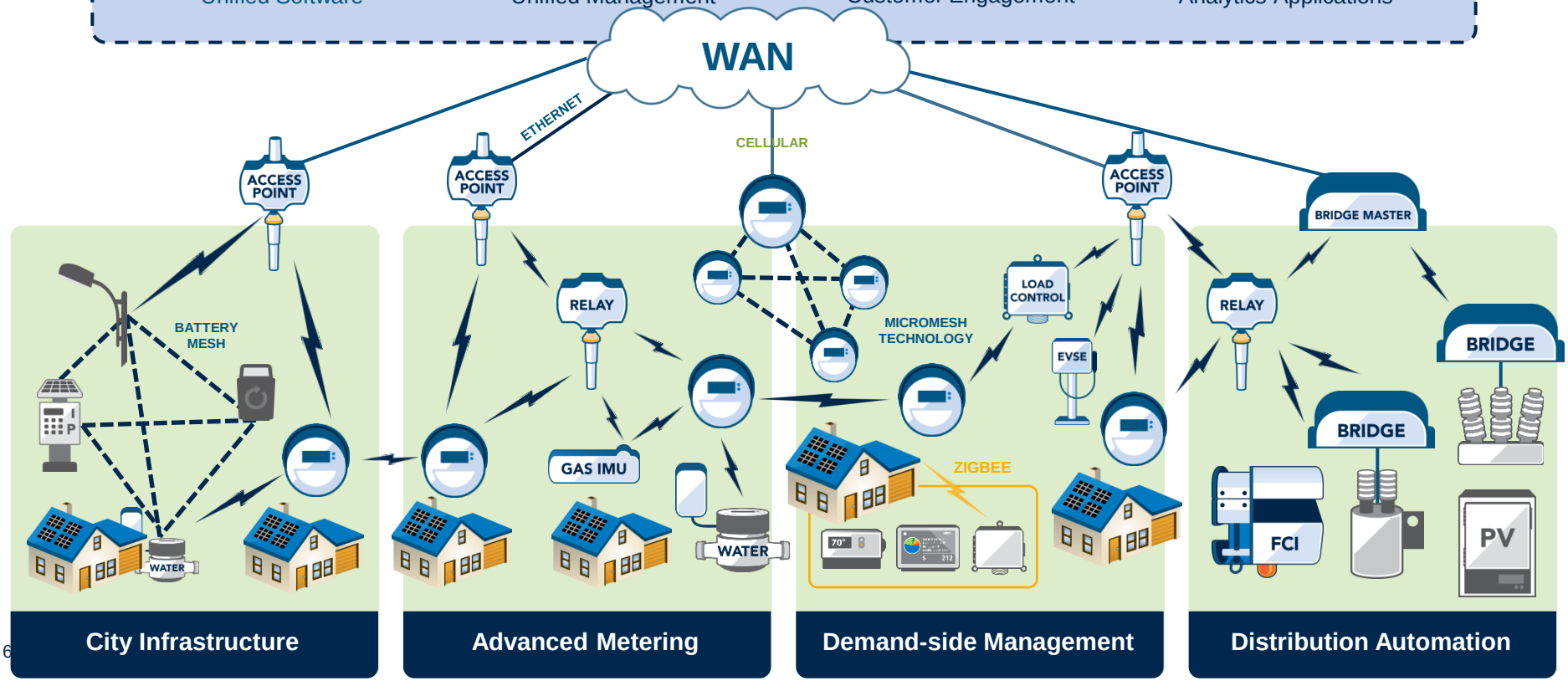


GridScape
Unified Management



CustomerIQ
Customer Engagement

SilverLink
Analytics Applications



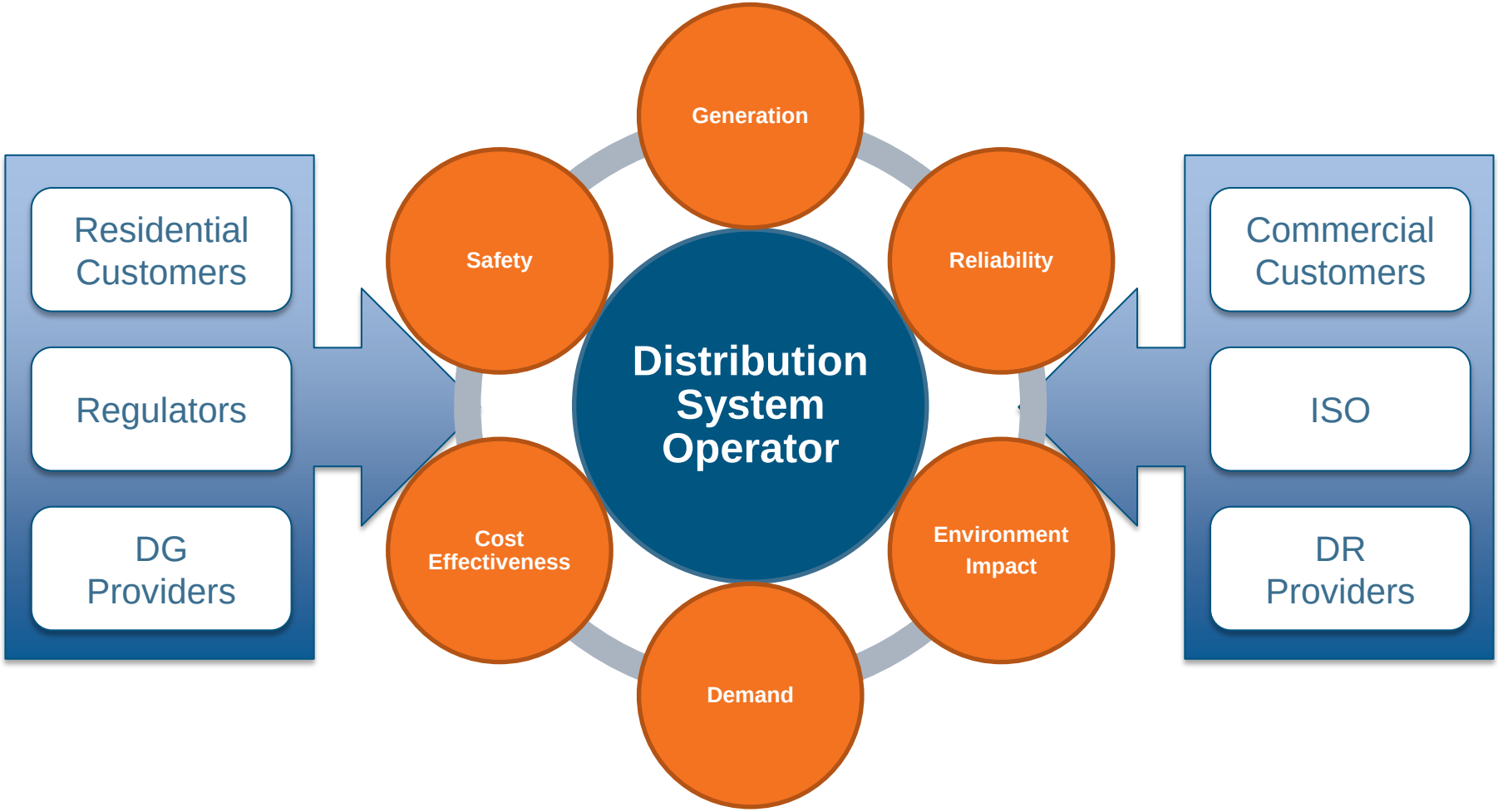
Increasing Distributed Generation

Key Challenges

- Developing public policy and basic interconnection standards
- Imperfect information and principle/agent issues for grid analysis & operation
- Ensure reliability and energy balance as DG penetration is dramatically increased
- Move beyond autonomous operation of smart inverters to direct grid side management

Distribution System Operator

A single operator of the electric grid is required



Integrated Grid Management

Vision for interconnected microgrids

Demand Management

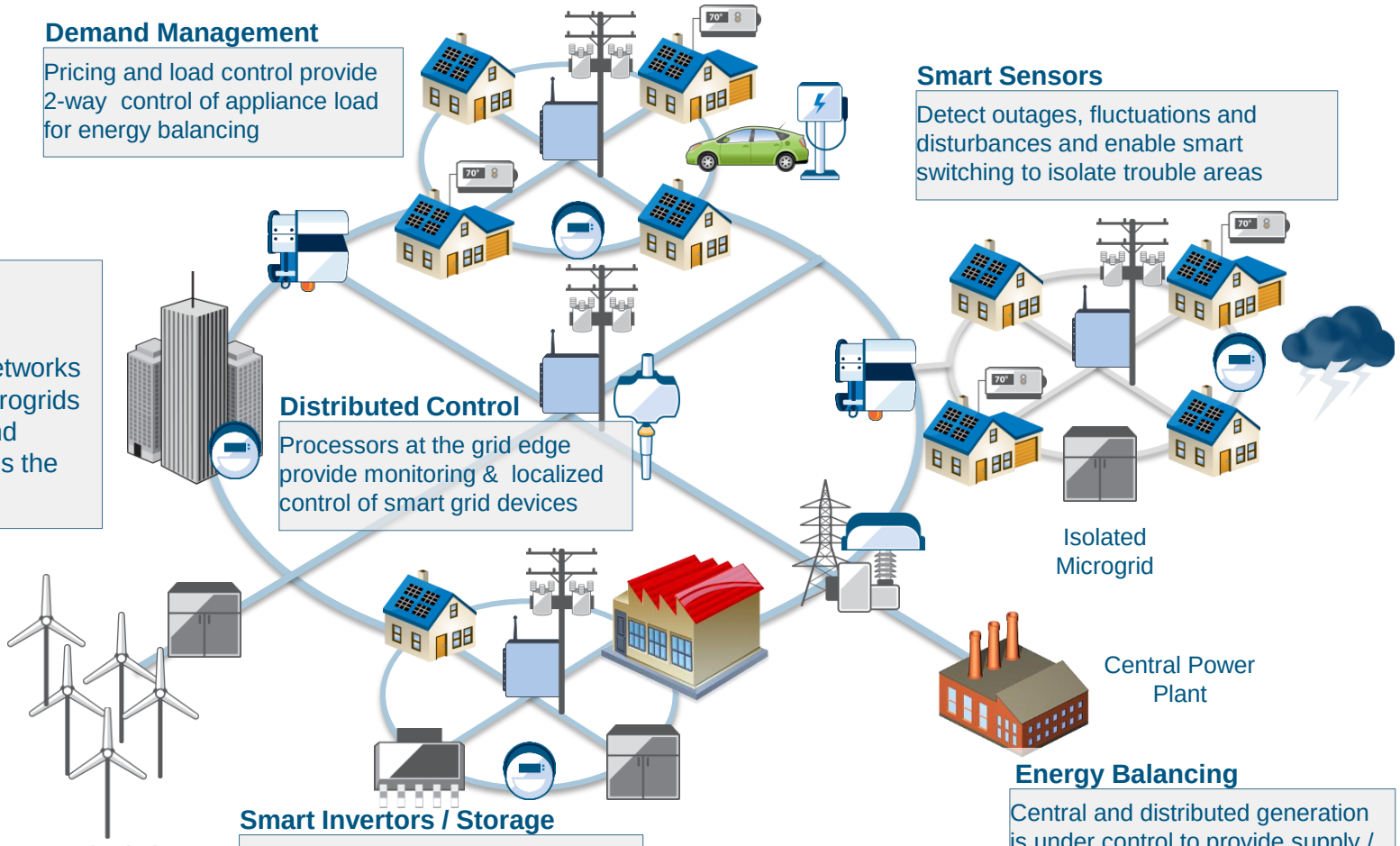
Pricing and load control provide 2-way control of appliance load for energy balancing

Smart Sensors

Detect outages, fluctuations and disturbances and enable smart switching to isolate trouble areas

Smart Grid

Distribution System Operators manage networks of interconnected microgrids providing reliability and energy balance across the grid



Distributed Control

Processors at the grid edge provide monitoring & localized control of smart grid devices

Isolated Microgrid

Central Power Plant

Central Wind Farm

Smart Invertors / Storage

PV, storage, and voltage regulators can be managed in real-time to improve grid performance

Energy Balancing

Central and distributed generation is under control to provide supply / demand balancing across the grid

A layered approach by distribution system operators will enable deep penetration of distributed generation

1 Establish Foundation

- Foundational communication platform
- Meters as distributed sensors
- Policies for autonomous smart invertors
- Utility / DG operator data sharing for improved analytics

2 Upgrade Distribution Network

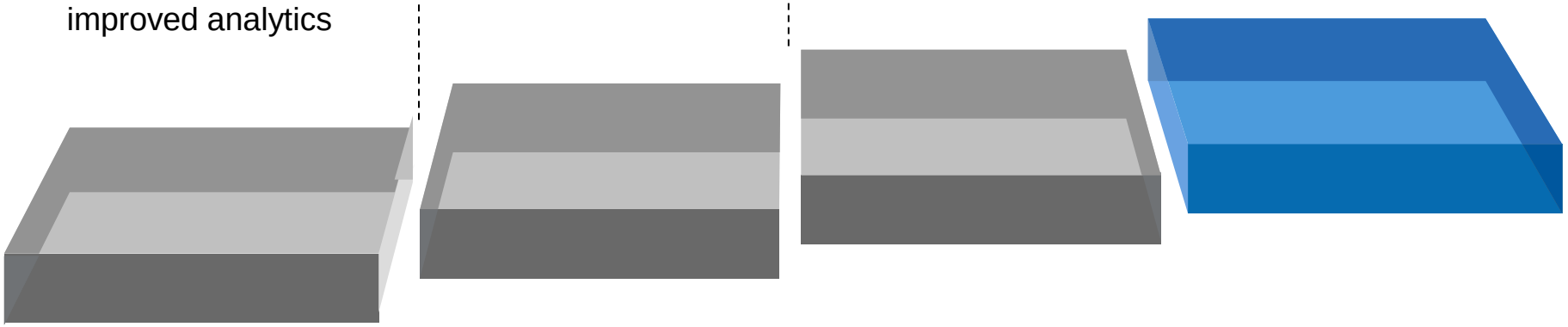
- Enabling networked grid devices
- Capacitor control
- Automated switching/reclosing
- Outage/restoration
- Voltage/VAR control

3 Match Variability of Supply to Demand

- Modernize demand response programs
- Next generation demand response
- Energy storage services

4 Enhanced Control of Distributed Devices

- Smart Grid connected inverters for real-time control
- Solid state voltage regulation
- Grid edge energy balancing and micro gridding



Data/Device Integration Strategies

	Step 1	Step 2	Step 3
	Grid assessment & autonomous operations	**Data sharing for improved analytics**	**Integrated devices for grid management**
Distribution System Operators (Utilities)	Deploy smart meters and smart sensors to assess local DG impact analysis	Make smart meter data accessible to DG providers for payback analysis	Enable deep penetration of grid connected generation assets
DG Providers	Adopt smart invertors capable of autonomous operation based on adopted policy	Make inverter generation data available to DSOs for improved local DG impact analysis	Enable direct DSO control of invertors as grid connected generation assets

Thank You!

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